What is claimed is:

1. A mass spectrometer comprising:

an ionization source to produce ions;

a plurality of multipoles to cool, guide or select said ions;

a collision surface for fragmenting said ions; and

a mass analyzer to analyze said ions.

2. A mass spectrometer according to claim 1, wherein said ionization source is selected from the group consisting of electrospray ionization source, nanospray ionization source, microspray ionization source, matrix assisted laser desorption/ionization, electron ionization, chemical ionization and electron ionization.

3. A mass spectrometer according to claim 1, wherein said plurality of multipoles further comprise at least one quadrupole.

4. A mass spectrometer according to claim 1, wherein a potential is applied between said ionization source and said collision surface to allow said ions to undergo surface induced dissociation.

5. A mass spectrometer according to claim 1, wherein said mass analyzer is selected from the group consisting of time-of-flight (TOF) mass analyzer, fourier transform ion cyclotron resonance (FTICR) mass analyzer, quadrupole ion trap mass analyzer and coaxial multiple reflection TOF mass analyzer.

6. A mass spectrometer according to claim 1, wherein a potential is applied between said ionization source and said collision surface such that said ions pass through all of said multipoles without colliding with said collision surface.

7. A mass spectrometer according to claim 1, wherein said plurality of multipoles comprise first, second and third multipoles.

8. A mass spectrometer according to claim 7, wherein at least one of said first, second or third multipole comprises a quadrupole.

9. A mass spectrometer according to claim 7, wherein said first and second multipoles are arranged coaxially.

10. A mass spectrometer according to claim 7, wherein said collision surface is positioned between said second and third multipoles.

11. A mass spectrometer according to claim 7, wherein said collision surface is positioned at an angle to a co-axis of said first and second multipoles.

12. A mass spectrometer according to claim 7, wherein said first multipole collisionally cools said ions.

13. A mass spectrometer according to claim 7, wherein a potential is applied between said ionization source and said collision surface such that said ions pass through all of said multipoles without colliding with said collision surface.

14. A mass spectrometer according to claim 7, wherein said third multipole contains a collision gas to fragment said ions.

15. A mass spectrometer according to claim 7, wherein said first multipole selects ions of a predetermined m/z range, wherein a potential is applied between said ionization source and said collision surface such that said selected ions will not collide with said collision surface, and wherein said third multipole contains a collision gas to fragment said selected ions.

16. A mass spectrometer comprising:

an ionization source to produce ions;

first, second and third multipoles to cool, guide or select said ions;

a collision surface for fragmenting said ions; and

a mass analyzer to analyze said ions;

wherein said first and second multipoles are arranged coaxially;

wherein said collision surface is positioned between said second and third multipoles; and

wherein said collision surface is positioned at an angle to said axis of said first and second multipoles.

17. A mass spectrometer according to claim 16, wherein at least one of said first, second or third multipole comprises a quadrupole.

18. A mass spectrometer according to claim 16, wherein said first and second multipoles are arranged coaxially.

19. A mass spectrometer according to claim 16, wherein said collision surface is positioned between said second and third multipoles.

20. A mass spectrometer according to claim 16, wherein said collision surface is positioned at an angle to a co-axis of said first and second multipoles.

21. A mass spectrometer according to claim 16, wherein said first multipole collisionally cools said ions.

22. A mass spectrometer according to claim 16, wherein a potential is applied between said ionization source and said collision surface such that said ions pass through all of said multipoles without colliding with said collision surface.

23. A mass spectrometer according to claim 16, wherein said third multipole contains a collision gas to fragment said ions.

24. A mass spectrometer according to claim 16, wherein said first multipole selects ions of a predetermined m/z range, wherein a potential is applied between said ionization source and said collision surface such that said selected ions will not collide with said collision surface, and wherein said third multipole contains a collision gas to fragment said selected ions.

25. A mass spectrometer according to claim 16, wherein said ionization source is selected from the group consisting of electrospray ionization source, nanospray ionization source, microspray ionization source, matrix assisted laser desorption/ionization, chemical ionization and electron ionization.

26. A mass spectrometer comprising:

at least one sample;

a source of laser radiation for producing ions from said sample;

a plurality of multipoles to cool and guide said ions; and

a mass analyzer to analyze said ions.

27. A mass spectrometer according to claim 26, wherein said ionization source is selected from the group consisting of electrospray ionization source, nanospray ionization source, microspray ionization source, matrix assisted laser desorption/ionization, chemical ionization and electron ionization.

28. A mass spectrometer according to claim 26, wherein said plurality of multipoles further comprise at least one quadrupole.

29. A mass spectrometer according to claim 26, wherein said mass analyzer is selected from the group consisting of time-of-flight (TOF) mass analyzer, fourier transform ion cyclotron resonance (FTICR) mass analyzer, quadrupole ion trap mass analyzer and coaxial multiple reflection TOF mass analyzer.

30. A mass spectrometer according to claim 26, wherein said plurality of multipoles comprise first, second and third multipoles.

31. A mass spectrometer according to claim 30, wherein at least one of said first, second or third multipole comprises a quadrupole.

32. A mass spectrometer according to claim 30, wherein said first and second multipoles are arranged coaxially.

33. A mass spectrometer according to claim 30, wherein said MALDI sample is positioned between said second and third multipoles.

34. A mass spectrometer according to claim 30, wherein said MALDI sample is positioned at an angle to a co-axis of said first and second multipoles.

35. A mass spectrometer according to claim 30, wherein said third multipole contains a collision gas to fragment said ions.

36. A Q-SID-Q-TOF mass spectrometer comprising:

an ionization source to produce ions;

a plurality of multipoles comprising at least one quadrupole;

a collision surface for fragmenting said ions; and

a time-of-flight mass analyzer to analyze said fragmented ions.

37. A Q-SID-Q-TOF mass spectrometer according to claim 36, wherein said ionization source is selected from the group consisting of electrospray ionization source, nanospray ionization source, microspray ionization source, matrix assisted laser desorption/ionization, chemical ionization and electron ionization.

38. A Q-SID-Q-TOF mass spectrometer according to claim 36, wherein a potential is applied between said ionization source and said collision surface to allow said ions to undergo surface induced dissociation.

39. A Q-SID-Q-TOF mass spectrometer according to claim 36, wherein a potential is applied between said ionization source and said collision surface such that said ions pass through all of said multipoles without colliding with said collision surface.

40. A Q-SID-Q-TOF mass spectrometer according to claim 36, wherein said plurality of multipoles comprise one quadrupole and first and second multipoles.

41. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein said first multipole and said quadrupole are arranged coaxially.

42. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein said collision surface is positioned between said quadrupole and said second multipole.

43. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein said collision surface is positioned at an angle to a co-axis of said first multipole and said quadrupole.

44. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein said second multipole comprises a collision gas cell for collisionally cooling said fragmented ions.

45. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein said first multipole collisionally cools said ions.

46. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein a potential is applied between said ionization source and said collision surface such that said ions pass through all of said multipoles without colliding with said collision surface.

47. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein said second multipole contains a collision gas to fragment said ions.

48. A Q-SID-Q-TOF mass spectrometer according to claim 40, wherein said first multipole selects ions of a predetermined m/z range, wherein a potential is applied between said ionization source and said collision surface such that said selected ions will not collide with said collision surface, and wherein said second multipole contains a collision gas to fragment said selected ions.